

Abstract

A gas turbine engine comprised of a rotating pressure vessel with tangentially oriented aeolipile nozzles which produce reaction thrust torque to power the external rotating shell of a dynamic compressor. The rotor blades or impeller of the compressor are then attached to and powered by the external rotating shell. The entire outside of the engine rotates allowing for high-pressure air to be supplied to the inlet of the combustor/turbine assembly. The single stage expansion through a few supersonic nozzles eliminates rotor tip clearance problems and allows for fewer larger nozzles, higher Reynolds numbers, lower surface area exposed to hot gases and, therefore, higher inlet temperatures and/or lower film cooling demands. Ceramic inserts in the throats of the nozzles would allow for stoichiometric air/fuel ratios without film cooling. At least some of the cooling can be accomplished externally with ambient air. The kinetic energy remaining in the high-speed exhaust gases is then utilized for either rotational shaft work or high-speed propulsion.